FORESTER'S REPORT INDICATES HIGH VALUE OF EUCALYPTUS HERE

Louis Margolin, a forest examiner of the U. S. Forestry Service, who spent some six months in the Territory in 1909 and 1910, in looking into forestry problems here in connection with the Territorial bureau, has submitted a report concerning his work which is of considerable interest and value. The report deals largely with the cultivation of Eucalyptus in the Islands, and covers seventy-nine printed pages.

Mr. Margolin believes that the various species of the eucalyptus family can be grown here to great advantage, provided proper care is taken in selection and the character of soil and atmospheric conditions where they are planted. The following are extracts:

EUCALYPTUS CULTURE IN HAWAII.

The study of the eucalypts in the Hawaiian Islands, the results of which are now presented, was made in co-operation between the Forest Service of the United States Department of Agriculture and the Territorial Board of Commissioners of Agriculture and Forestry, at the request of the superintendent of forestry.

The field work extended over a period of four months (December, 1909-March, 1910), during which time practically all the important groves of eucalyptus on the Islands of Hawaii, Maui, Oahu and Kauai were visited and examined. Complete measurement were made on 500 felled trees for the purpose of constructing volume tables. Wherever the groves were old enough sample plots were established, which should serve as a basis for studying future growth.

The object of this report is to bring together and correlate the information obtained in regard to eucalyptus on the various islands, and to outline a system of forest management for planted groves. Since most of the systematic tree planting on these islands has been done only during the last decade, and few stands are now more than five or six years old, not enough definite data are available at present to forecast with any degree of certainty the exact financial returns that may be expected, but the information obtained indicates very clearly that a number of species of the eucalyptus can be grown at a good profit in many places on the Hawaiian Islands.

Need of Local Timber Supply.

The Territory of Hawaii, with its extensive sugar plantations, camps, flumes, tunnels and irrigation ditches, uses large quantities of timber and lumber. No complete statistics on this subject are available, but the following figures may be considered as quite conservative. There were during the last three or four years used annually in Hawaii over forty million board feet of sawed lumber and timber, 75,000 cords of firewood, 20,000 to 25,000 railroad ties, 25,000,000 shingles and 40,000 to 50,000 fence posts. This annual consumption of wood represents a value to the consumer of at least one and one-half million dollars. With the more intensive development of the plantations, the increase in population, the development of irrigation systems, homesteads and small farming, and the further extension of roads and power lines, the consumption of lumber will constantly increase. The problem of finding an adequate source of supply of wood becomes, therefore, of paramount importance to the future growth of the country.

The native Hawaiian forest is entirely inadequate to meet the demand for lumber in the Territory.

An increasing supply of inexpensive lumber is essential to the proper growth and development of the Hawaiian Islands. The native forests are entirely inadequate both in extent and character to furnish this supply. The continental United States is approaching a time when it will be no longer in a position to export cheap lumber to Hawaii. The islands can grow their own lumber supply before the timber scarcity comes, provided immediate planting is done on a commercial scale.

Forest Planting in Hawaii in the Past.

In the past, more or less sporadic tree planting was done in the Hawaiian Islands, which at first was confined mainly to the introduction of exotic fruit trees, such as mango, alligator pear, and similar plants, but later included many valuable ornamental and timber trees. The introduction of exotic plants received especial impetus in 1881, as a result of a tour of the world by King Kalakaua, who sent back to the islands seed and cuttings of many important plants, some of which may now be found growing on almost every island in the group.

The early planting was largely without any system and was purely for ornamental purposes. Little attempt has been made to utilize the information obtained by this experimental planting, and outside of the eucalypts, ironwood (Casuarina), acacias, silk oak (Grevillea), and three or four other species, the introduced trees occur singly, and are rarely seen in groves or forests. It is not at all uncommon to find an old home surrounded by a grove containing from twenty to sixty different kinds of trees. Such planting, of course, is of little commercial value.

What is probably the oldest systematic forest planting is found at Ulupalakua on the Island of Maui, where, on Prospect Hill, at an elevation of 2,800 feet, may be seen a grove of eucalypts forty to fifty years old. Although the trees were planted for ornamental purposes, and are not properly spaced, they have shown remarkably good growth and clearly indicate the adaptability of the eucalypts to certain localities in Hawaii. Trees three or four feet in diameter and seventy-five to one hundred feet in height are not uncommon.

Next in point of age is a grove of ironwood (Casuarina equisetifolia), about four acres in extent, planted in 1874 near Lihue, Island of Kauai, on the land of Grove Farm. Here may also be found various younger groves of ironwood, as well as groves of eucalypts and silk oak (Grevillea robusta.)

The Lihue Plantation on the Island of Kauai wac the first to begin the systematic planting of forests for purely commercial purposes. The native forest had been destroyed and a scarcity of wood was imminent. Accordingly, a German forester was employed in 1882 to plant trees for the purpose of supplying the plantation with fuel. The forester remained for fifteen years, during which time a large tract of land was replanted, mostly with ironwoods. Forest planting is regarded at Lihue as a regular part of the plantation program, new groves being started every year.

About the same time the government began the systematic reforestation of the slopes of Tantalus, back of Honolulu. More than thirty different species of eucalypts were here planted, besides a number of other kinds of trees. One of the most promising commercial groves of trees may be found on the land of the Paauhau Plantation, in the Hamakua district, on the Island of Hawaii. On an area ofabout forty acres two species of eucalypts were planted, E. globulus, the blue gum, and E. citriodora, the lemon-scented gum. A more complete description of this grove is given later on.

The most extensive planting of eucalyptus on a commercial scale was begun in 1896 on the Island of Maui by the Maui Agricultural Company. This planting has continued almost without a break to the present time. A number of species have been thoroughly tried, and the results obtained are most encouraging.

The planting in the past has shown that of the many kinds of trees so far tried, the various species of eucalyptus are the most promising and are best suited to the purposes for which planting is done on the islands. Other trees, like ironwoods, are particularly good for certain uses, as for windbreaks, and for certain localities, such as sandy sea beaches, but the eucalypts are the best all-around trees in most situations.

The various species of eucalypts differ from each other not only in size and form but also in their physical and climatic requirements of moisture, temperature, soil, etc. Many eucalypts are straight, cylindrical and clear of branches for a great height, while others are crooked, forked and branchy. The wood of some trees is soft and brittle, while that of others is hard and tough and very durable. Some eucalypts can thrive on poor soils and can stand much drought, while others require rich, moist soils and plenty of rainfall. By a judicious selection it is thus possible to choose species of eucalypts suitable to almost any situation in Hawaii and fit for almost any use to which wood is put.

Enemies.

The eucalypts in Hawaii, so far as observed, are remarkably free from insect and fungous enemies. In particularly dry locations and in unusual drought a eucalyptus plantation may be in danger from fire, since the dry leaves and twigs and the fallen shreds of bark are quite inflammable. The danger from fire is further increased by the rank growth of weeds found in the more widely spaced plantations.

On some stock ranches in Hawaii eucalypts are planted for the express purpose of furnishing shade to cattle during the hot season, and shelter against rain and cold. Under such circumstances the value of the trees for timber and fuel is a secondary consideration, and it is only necessary to protect the trees long enough to insure their successful establishment. A cattle-proof fence for the first six or seven years will usually accomplish this object. At the end of that time the fence may be taken down and moved to a place where a new plantation is to be established.

Where the primary object of a plantation is to raise timber trees, cattle should be kept out until the trees have reached a diameter of at least four inches.

Uses of Eucalyptus.

The main objects in planting trees in Hawaii may be enumerated as follows: For the production of fuel, fence posts, lumber and timber; for the protection of watersheds; for windbreaks and shade; for esthetic purposes. It will be found that the various species of eucalyptus are admirably adapted to the above uses. Not all of the eucalypts are equally well suited to the various purposes for which trees are planted, but among the long list of species some are best adapted for one use, some for another. A tree which may yield an excellent fuel wood may not rank high as a fence post tree, because its wood may not be durable; and so with the other uses. The selection of the proper species for the desired purpose will require a knowledge of the qualities of the different eucalypts. A brief description of the uses of the leading species is given in the appendix.

Fuel.

The most immediate need for planting trees in Hawaii is to furnish the extensive plantations with an adequate supply of fuel. The sugar mills are invariably run with bagasse or cane pulp left after the juice has been pressed out. In a few cases there is a slight excess of cane refuse which is bundled up and used as domestic fuel, but with this unimportant exception all the fuel used for domestic purposes is either wood or coal.

The plantations usually agree to furnish their laborers with the necessary shelter and firewood. The fuel thus consumed averages, roughly, about half a cord of wood per person per year, counting not only the laborers, but also their families. With the average population on a plantation figured at 2,000 persons, the annual consumption is about 1,000 cords of wood. The present price of cordwood delivered at the plantation varies from about $5.50 per cord for kiawe or algaroba and young blue gum to $12.00 or more per cord for slabs of ihia lehua, the fuel value of the latter ranking very high. The fuel expenses to the average plantation amounts, therefore, to at least $5500 and may run as high as $10,000 per year. On some plantations it is impossible to obtain wood at reasonable price, and the laborers are supplied with coal or oil for fuel. The problem of obtaining an adequate fuel supply is therefore of great importance to the plantations, and deserves careful consideration, for it must be remembered that the price of wood is constantly rising.

Fence Posts and Ties.

Next to the need for fuel the greatest need for wood on the islands is for fence posts and ties. A considerable proportion of the fence posts and almost all the railroad ties used in the Territory are at present imported from the coast, at a cost averaging about 30 cents per post and 60 to 75 cents per tie. There is no reason why the demand for this material should not be supplied locally. Many of the eucalypts, because of the great durability of their wood when in contact with the soil, are well suited for ties and posts.

Lumber and Timber.

The greatest value of the eucalypts lies in the general usefulness of their timber which, with the gradual disappearance of the American hardwoods, is becoming of even greater importance. Among the eucalypts may be found some of the most valuable timber in the world, though the species differ in the strength, weight and durability of their woods.

Watershed Protection.

An abundant and regular flow of water is essential to the successful raising of crops in Hawaii, since, in spite of heavy rainfall in certain localities in the islands, a large proportion of the cultivated land is under irrigation. Many of the richest sugar cane fields are absolutely dependent on an adequate supply of water during the dry season.

A systematic artifical reforestation of denuded slopes on important watersheds is already receiving attention, and the interest in this work will become more marked as time goes on. Planting trees to protect watersheds will be considered by many to be more important than planting them for lumber and fuel production, though under proper management one forest may be made to serve both purposes. Many eucalypts are well suited for the purpose of water protection if planted closely together of if under-planted with some undergrowth to afford protection to the soil. A properly-managed eucalyptus protection forest should pay for itself in course of time.